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09/715,701	11/16/2000	Andrew Wolfe	2926	8544

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EXAMINER

SAJOUS, WESNER

ART UNIT PAPER NUMBER

2676

DATE MAILED: 08/27/2004

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/715,701

Applicant(s)

WOLFE, ANDREW

Examiner

Wesner Sajous

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4,7-9,11-27 and 29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-27 is/are allowed.
- 6) ☒ Claim(s) 1,4-6,8,9,11-13 and 29 is/are rejected.
- 7) ☒ Claim(s) 7 and 15-17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

Remark

1. This communication is responsive to the amendments and response filed on June 04, 2004. Claims 1, 4, 7-9, 11-27, and 29 are presented for examination.

Response to Amendments/Arguments

The Applicant, at page 10 of the response, argues that because the definition of the "source operand" and destination operand" is defined in the specification as recited at page 15, lines 3-4 and at lines 5-7, respectively, the Applicant does not believe that the features need to be recited in claim 1 and contends that Dye does not contemplate a bounding box about sets of pixel locations which are read (source operand), nor the determination of whether the first bounding box (surrounding at least one source operand) and the second bounding box overlap wherein a dependency is detected.

The Examiner, in response, respectfully disagrees. Because the terms "source operand" and "destination operand" are not terms of arts, their definitions as described in the specification cannot be read into the claims. Thus, since it is not defined in the claim of what is intended by a "source operand" and "destination operand", these terms for examination purposes are broadly interpreted as they are recited in the claim.

Further, as described in the previous action, the X, Y, Z space of an object is interpreted as the bounding box and the region therein is noted to act as the "source operand" or the "destination operand". The objects are primitives. Dye at col. 66, lines 35-37, suggests that a collision would occur when the X, Y, Z space of a first objects

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collides with the X, Y, Z space of a second object. At col. 66, lines 55-57, he suggests the comparison for union between bounding boxes. Further, Dye suggests that the XY positional data (e.g., the coordinate space) is used to indicate the location of triangles that will be drawn in the display memory (see col. 45, lines 29-32). Those of artisan skilled in the art would have understood that the generation object boxes in Dye are associated to pixel locations at the display. Therefore, Dye contemplates the determination of whether the first bounding box (surrounding at least one source operand) and the second bounding box overlap wherein a dependency is detected. As per the argument that Dye does contemplate a bounding box about sets of pixel locations which are read, it is noted that the features upon which applicant relies are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

As per the Applicant arguments at page 11, paragraphs 2-3 of the response, it is noted since in Dye there is not suggestion that the object bounding boxes are simultaneously generated. And, because it is suggested that the display list containing the bounding boxes are assembled on a per object basis for execution purposes (see col. 67, lines 30-34), it is therefore the Examiner interpretation that the boxes are sequentially generated (i.e., box 1 first and box 2 second). As discussed above, the source or destination operands are the inner portions of the object boxes because the bounding boxes surround them. This being the case, the window space or the display area on which the bounding boxes will be generated characterizes the source and

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destination operands. Wherein the inner region of box 1 corresponds to the source operand, and it sets the characteristics for determining the destination operand as understood by the Examiner. Further, Dye, at col. 46, lines 5-6, suggests that a bit addressable control is used to align data from one source address to a destination address, and the XY positional data is to indicate the location of triangles that will be drawn in the display memory (see col. 45, lines 29-32). Those of artisan skilled in the art would have understood that the generation object boxes in Dye are associated to pixel locations at the display. Hence, the bounding boxes are generated about the source or destination operands, which implies that the source or destination operands need be recognized first prior to rendering and comparing the bounding boxes, as performed by Dye (see col. 66, lines 55-57). Thus, the Examiner still believes that it is inherent that a bounding box be generated about a source operand in order to determine a destination bounding box. And, in comparing the bounding boxes, source operand and destination operands are also compared.

With regards to the Applicant's argument at paragraphs 4 and 5, page 11 to page 5 of the response, contending that there is no suggestion or motivation in Dye to determine whether a source bounding overlaps with a destination box; and that the ordinary skilled in the art would not contemplate the use of source bounding boxes in Dye. The Applicant is directed to Dye's col. 67, lines 30-34, where it is suggested that coordinates of box 1 is compared with the coordinates of box 2 to determine if box 1 intersects box 2. And, as discussed above, since box 1 that is being compared with box 2 is generated about a source operand and treated as a source operand and box 2 with

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inner portion as the destination operand, Dye contemplates the use of source and destination bounding boxes and the determining of whether a source bounding overlaps with a destination box. Wherein the determination of intersecting boxes is equivalent to the determination of overlapping bounding boxes. Thus, Applicant's argument is not persuasive.

With regard to the claim 11's argument set forth by the Applicant at page 12 of the response, it is noted that since Dye performs the comparisons of bounding boxes for intersection in coordinate space (see col. 66, lines 30-34), it is the Examiner's belief that sets pixel locations for the boxes are compared, because it is an industry standard for the generation of primitive objects to include pixels. Thus, in comparing the boxes their pixel locations are also compared. Thus, the limitations of claim 11 are not deemed allowable over the Dye reference.

Regarding claim 8, it is noted that since the Battle reference overcomes the deficiency of Dye by reciting a "write after read" dependency (i.e., read before write) see Battle's col. 6, lines 55-60, the invention of claim 8 is obvious over the prior art for the reason set forth in the previous office action.

With regard to claim 14, the Applicant argues that there is no mention of a source bounding, nor is it inherent that Dye would have a source reservation station for storing the box location.

In response, the Examiner respectfully disagrees. As discussed above, since box 1 is compared with box 2 (see Dye's col. 67, lines 30-34), Dye contemplate a source operand and a destination operand, which is construed by the Examiner to corresponds

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with box 1 and box 2, respectively, wherein the a source operand is treated as the inner portion of box 1 and the inner portion of box 2 is treated as the destination operand, because box 1 generated first prior to box 2.

With regards to the source reservation station for storing the boxes, it is noted that since in Dye a window workspace memory is provided to store the window data or the x/y address (which is constructed as the bounding), see figs. 26-26D or col. 4, lines 58-61; Dye, therefore, contemplates a source reservation station for storing the boxes. Thus, Applicant's arguments are not persuasive.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 5-6, 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sambonsugi et al., US Pat. No. 6335985.

Considering claim 1, Sambonsugi discloses a method for determining dependencies (*e.g., collisions or unions*) between a first graphics primitive (*i.e., a first object*) and a second graphics primitive (*e.g., a second object*), see col. 66, lines 35-37, and lines 43-60)), the method comprises calculating a first bounding box for the first graphics primitive (*e.g., determining bounding box of each object, see fig. 32, item 800,*

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see col. 67, lines 6-8, see also col. 66, lines 35-36 & 43-45); calculating a second bounding box for the second graphics primitive (see fig. 32, item 800, see col. 67, lines 6-8, see also col. 66, lines 35-36 & 43-45); and determining (e.g., at step 802 of fig. 32) whether the first bounding box and the second bounding box overlap (e.g., intersect), wherein a dependency (e.g., a collision or union) is detected if the [bounding] boxes overlap (or intersect), see col. 66, lines 43-50, and col. 67, lines 8-23. See also fig. 29 as the characteristic for when the two boxes overlap)).

It is noted that Dye lacks implicit recitation for the first bounding box surrounds a source operand of the first graphics primitive, and the second bounding box surrounds a destination operand of the second graphics primitive.

However, such a disclosure is at least obvious over the Dye reference. Dye discloses comparing two objects or bounding boxes to determine if collision (or dependencies) occurs. See col. 66, lines 32-66. Thus, by this embodiment, it is noted that since two bounding boxes are being compared, they are distinct from each other because they occupy different workspace or X, Y, Z space on the screen display. The destination bounding box is contemplated to be any of the boxes that will be compared with a first bounding box while the first box is being executed on the screen or window workspace area. It is to be noted that each window workspace area on the screen is deciphered to be represented in X, Y, Z coordinate space. And, Dye suggests that each object or bounding box is represented in X, Y, Z space (see col. 66, lines 32-50). Hence, a bounding box is [intrinsically] surrounding each window workspace area on the screen where triangles representing the each object or bounding box will be

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rendered. For it is not convinced that the two boxes are concurrently dispatched from the registers to the screen workspace for processing, because Dye suggests that the objects are assembled on a per object basis using X and Y bounds (see col. 67, lines 30-34). Hence, the screen workspace area for the second bounding box is characterized as the destination operand for any of the bounding boxes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Dye to include that the first bounding box surrounds a source operand of the first graphics primitive, and the second bounding box surrounds a destination operand of the second graphics primitive, in order to reduce the amount of Z-buffer memory bandwidth required for 3D animation. See col. 66, lines 54-56.

In claim 5, the claimed "first bounding box surrounds a destination operand of the first graphics primitive" is inherent in the disclosure of Dye because it is suggested that each object will be rendered in a workspace area. See *col. 67, lines 50-56*.

As per claim 6, the claimed "second bounding box surrounds a destination operand of the second graphics primitive" is inherent in the disclosure of Dye because it is suggested that each object will be rendered in a workspace area. See *col. 67, lines 50-56*.

The invention of claim 11 substantially recites the underlying steps performed by the method of claim 1. As the various elements of claim 1 have been shown to be obvious over the teachings of Dye, it is readily apparent the method disclosed by the applied prior art performs the recited underlying functions. As such the limitations

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recited in claim 11 are rejected for the same reason and rationale given above for claim

1. The Applicant should duly note that the source operand characterizes the Z memory or Z values of X, Y area of box 1 or 2 as implied to in the depiction at col. 67, lines 15-23. The Z memory, as applied in Dye characterizes the display memory for box 2 of the second object. Thus, it can be used as the source operand for the locations of pixels by the second object (or the second graphics primitive).

As per 12, claim Dye, at fig. 32, discloses the step of comparing comprising calculating a first bounding box which surrounds the set of destination pixels location of the first graphics primitive (*as met by step 800*); calculating a second bounding box for each of the at least one set of source pixel locations of the second graphics primitive (*as met by step 800, see col. 67, lines 6-8, see also col. 66, lines 43-45*); and determining whether there is dependency if the first and ... overlap (*as met by step 802 of fig. 32, see col. 67, lines 8-23*)).

Claim 13 is rejected for the same reason as claim 10.

3. Claims 4, 8-9 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dye in view of Battle (US Pat. 6417848).

Re claim 4, Dye discloses or renders obvious most claimed features of the invention, he fails to teach detecting a write after read dependency.

Battle, in a similar art, teaches detecting a write after read (e.g., read-before-write) dependency. See col. 8, lines 39-45.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Dye to include the write after read dependency determination, as taught by Battle; in order to provide software solutions that create clusters that are free from processing hazards. See Battle's col. 6, lines 55-60.

Regarding claim 8, Dye discloses or renders obvious most claimed features of the invention, as set forth in the previous office action, paper # 10; however, he fails to teach the step of determining whether a write after write dependency exists between graphics primitives as a function of the comparison of the destination pixel locations.

Battle, in a similar art, teaches the equivalence for determining a write after write dependency exists between graphics primitives as a function of the comparison of the destination pixel locations. See col. 7, line 55 to col. 8, line 16, wherein the clustered overlaps pixels being processed by the graphics pipeline correspond with the graphics primitives.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Dye to include the write after write dependency determination, as taught by Battle; in order to provide software solutions that create clusters that are free from processing hazards. See Battle's col. 6, lines 55-60.

Claim 9 contains features that are analogous to the limitations recited in claim 1; it is, therefore, rejected under Dye for the same reason as claim 1.

The invention of claim 29 contains features that are substantially equivalent to the features recited in claims 8 and 9 and/or combined claims 1 and 4. As the limitations of claims 8 and 9 and/or claims 1 and 4 have been found to be obvious over

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the teachings of Dye and Battle, it is readily apparent that the method of the applied prior art performs the underlying functions. This being the case, the limitations recited in claim 29 are rejected under the same reasons and rationale set forth for claims 8 and 9 and/or combined claims 1 and 4.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 14 is rejected under 35 U.S.C. 102(e) as being anticipated by Dye.

Considering claim 14, Dye, at figs. 26 (A-E) and 28-32, discloses an apparatus for determining dependencies (*e.g., collisions or unions*) between a first graphics primitive (*i.e., a first object*) and a second graphics primitive (*e.g., a second object*), see col. 66, lines 35-37, and lines 43-60)), method comprising a destination reservation station (*e.g., windows workspace memory 30 or 50, see figs. 26[B or C]*); for storing a destination bounding box location for the first graphics primitive (*e.g., object or ID#*); a source reservation station (*e.g., display refresh list 10, see fig. 26A*) for storing a source bounding box location for the first graphics primitive; and a first comparator (*e.g., the representation of display memory, see fig. 28*) for comparing the destination bounding

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box location for the first graphics primitive with a bounding box location of the second graphics primitive and generating a first resultant bit (e.g., a color bit or overlay bit, as depicted in figs 31 and 32). See col. 66, lines 32-66.

Allowable Subject Matter

5. Claims 18-27 are allowed over the prior art.
6. Claims 7, 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reasons for Indicating Allowable Subject Matters

7. The present application has been thoroughly reviewed. Upon searching a variety of databases, the Examiner respectfully submits that the prior art of record (see PTO-892 Form) fail to teach or suggest a method for parallel processing of a plurality of 3D primitives in an out of order sequence comprises processing at least two of the primitives in order at the same time, where that at least two of the primitives have no dependency and wherein a first primitive in the at least two is completely processed before the others; *detecting a dependency between a next primitive to be processed from the plurality in the queue and the primitives in the at least two which have not yet been completely processed; and skipping the next primitive to be processed from the plurality in the queue and processing a subsequent primitive from the plurality in the queue, wherein no dependency is detected between the subsequent primitive and the*

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primitives in the at least two which have not yet been completely processed, as recited in claims 18 [and 19 by dependency].

Claims 20-27 recite in part the underlying features of claims 19-20, and they are allowed over the prior art for at least the same reasons as claims 19-20.

Regarding claims 15-17, it is respectfully submitted that the Dye reference fails to teach a second and a third comparator for comparing the source bounding box location and the destination bounding box for the first graphics primitive with the destination bounding box location and the source bounding box location, respectively, of the second graphics primitive and generating a second and a third bit, respectively.

Claim 7 are allowed because the prior art fail to teach "a write after write dependency is detected if the second bounding box overlaps the first bounding box" as recited in claim 7.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any response to this action should be mailed to:

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or faxed to:

(703) 872-9314, (for technology center 26000 only)

Or:

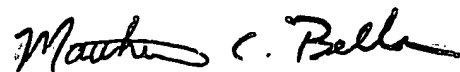
(703) 308-5359 for informal or draft communications, please label "PROPOSED"

or DRAFT")

Hand-held delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, 6th floor (receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesner Sajous whose telephone number is (703) 308-5857. The examiner can be reached on Mondays thru Thursdays and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Supervisor, Matthew Bella, can be reached at (703) 308-6829. The fax phone number for this group is (703) 308-6606.



Wesner Sajous



8/17/04

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